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November 25, 1961

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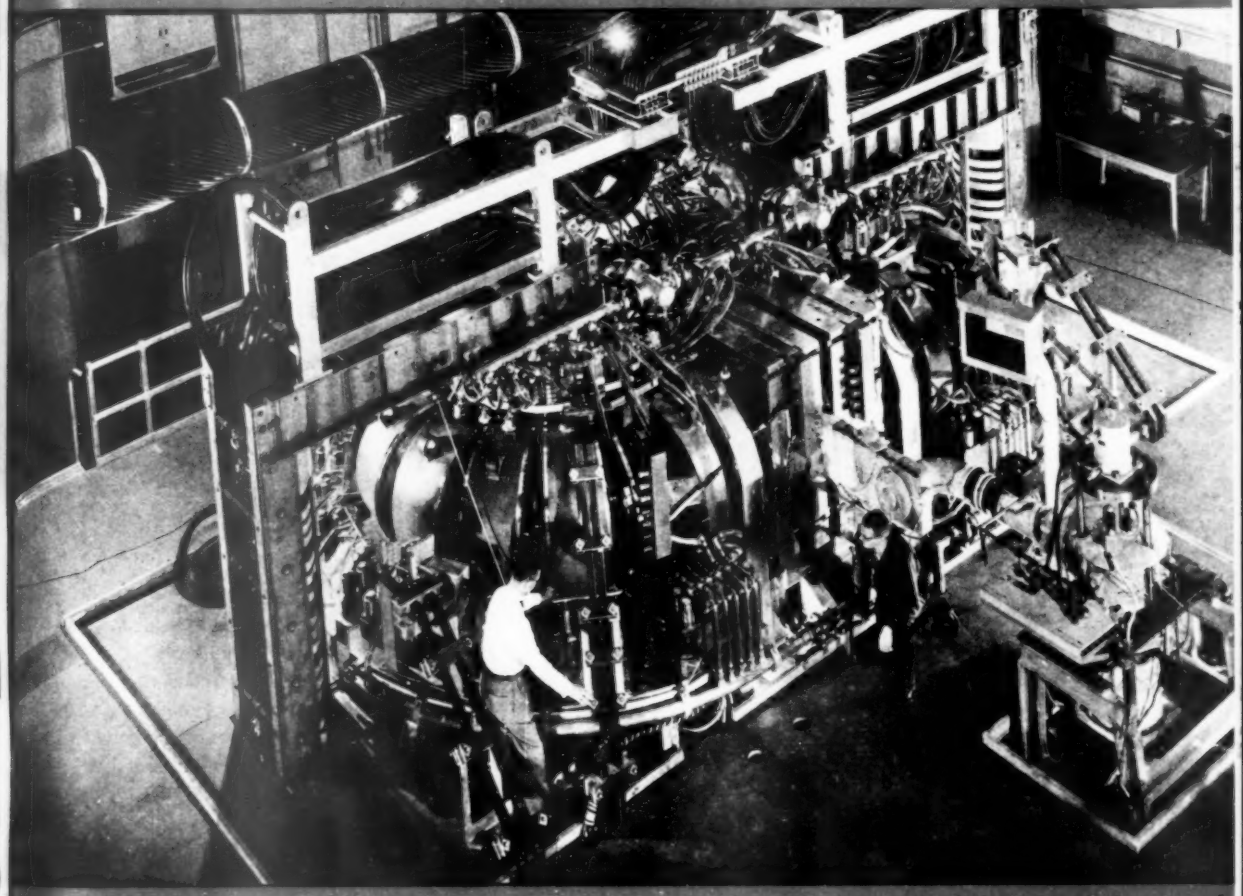
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Steel Stellarator

See Page 349

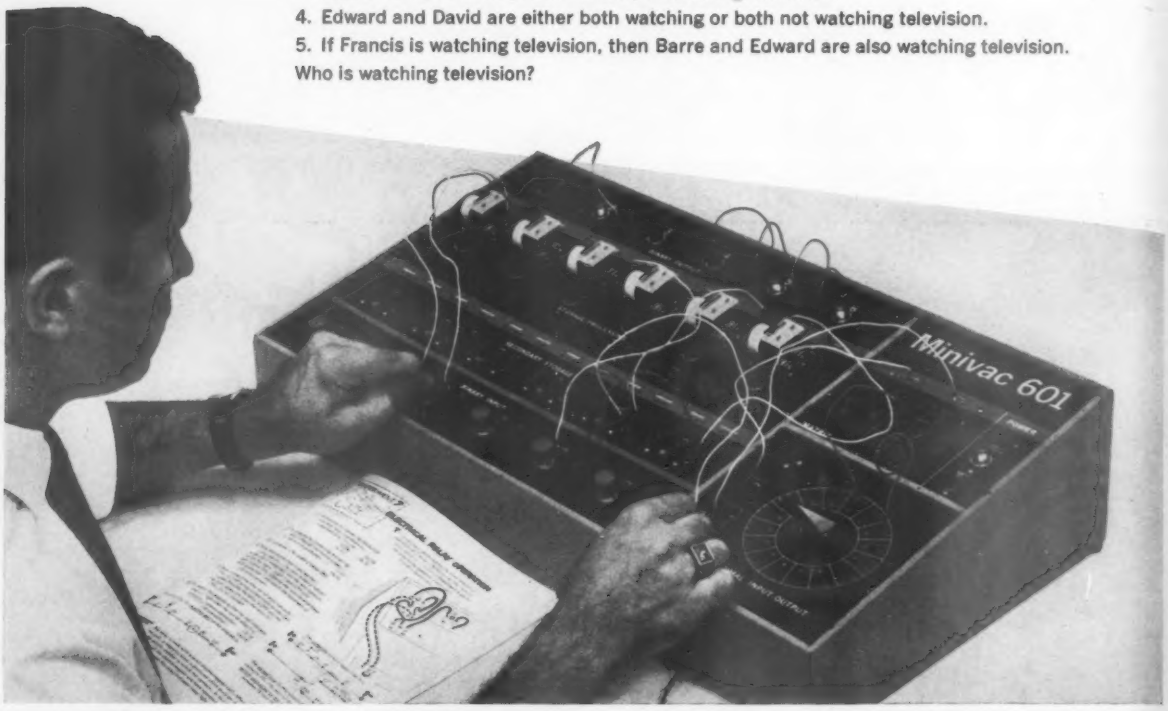
A SCIENCE SERVICE PUBLICATION

Q

Barre, his wife, Clara, and their children, David, Edward, and Francis are at home. It is eight in the evening.

1. If Barre is watching television, so is his wife.
2. Either Edward or Francis, or both, are watching television.
3. Either Clara, or David, but not both, is watching television.
4. Edward and David are either both watching or both not watching television.
5. If Francis is watching television, then Barre and Edward are also watching television.

Who is watching television?



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METEOROLOGY

World's Weather by Tiros

Scientists from 27 countries came to the U.S. for a 10-day meteorological workshop studying information from the Tiros weather satellites, Ann Ewing reports.

➤ THE THREE TIROS satellites have greatly helped in plotting the world's weather and spotting severe storms.

To learn how to use the photographs in forecasting, some 40 meteorologists representing the weather services of 27 nations were in Washington, D.C., for a 10-day International Meteorological Satellite Workshop from Nov. 13 through 22.

Tiros III, the meteorologists were told, has photographed 18 tropical storms in all stages of development. On Sept. 10, the "hurricane hunter" satellite made history by discovering Hurricane Esther while it was forming. Without the satellite photographs, this hurricane might have gone undetected for days.

Altogether, five hurricanes and one tropical storm were seen by Tiros in the Atlantic, and two hurricanes and a tropical storm were photographed in the eastern Pacific. Nine typhoons were followed in the central and western Pacific.

On 17 days since the launching of Tiros III, information revealed by satellite photographs has led to revision of weather charts prepared at the U.S. Weather Bureau's National Meteorological Center.

The international workshop was held so meteorologists from other countries can in the future make direct use of United States satellite information in their daily weather forecasting. The workshop was arranged by the National Aeronautics and Space Administration and the Weather Bureau. The countries represented were Argentina, Brazil, Canada, Republic of China, Denmark, El Salvador, Finland, France, Federal Republic of Germany, Honduras, Iran, Ireland, Israel, Italy, Netherlands, Netherlands Antilles, New Zealand, Nigeria, Norway, Pakistan, Portugal, Republic of South Africa, Sudan, Thailand, United Arab Republic, United Kingdom, and the West Indies Federation. Russia, Poland and Czechoslovakia were invited and accepted but the delegates did not show at the meeting, although Russian scientists have expressed an interest in satellites to improve weather forecasting.

The Tiros satellites will be replaced in about a year by the "more useful and more nearly operational Nimbus series," James E. Webb, NASA Administrator, told the weathermen. Nimbus satellites will be focused on the earth at all times from polar orbits.

Then every country desiring and prepared to do so can receive information directly from the satellites.

This means, Mr. Webb said, that all nations could, for the first time, obtain an immediate and comprehensive view of the total cloud cover pattern in its own and neighboring geographic area.

Dr. F. W. Reichelderfer, chief of the Weather Bureau, noted that atmospheric science is global by nature and has no national boundaries.

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TECHNOLOGY

Speech Machine Can Sing

➤ A SYNTHETIC speech machine that produces natural sounds and can sing a simple song or say a few sentences has been developed at the Massachusetts Institute of Technology, Cambridge, Mass.

How the machine operates was reported to the Acoustical Society of America meeting in Cincinnati by Drs. M. H. L. Hecker, A. S. House and K. N. Stevens of MIT's electronics research laboratory.

They used an electronic device to represent the human body's major speech parts. These include the vocal tract, which extends from the larynx (voice box) to the lips, and the nasal cavities, which are linked to the vocal tract and extend to the nostrils. The device electronically simulates the sound pathways of the vocal tract and the nasal cavities.

The electronic control circuits are given detailed instructions concerning what to do and when. These instructions are determined by analyzing natural speech sounds, studying X-ray motion picture films of persons speaking, and knowing speech acoustics and phonetics.

Experiments with speech synthesizers, the scientists reported, consist of electronically changing the ways in which the vocal tract and nasal cavities react and when, then noting the effect such changes produce on the synthetic sound.

Studies of the performance of an artificial speech machine "reveal important details concerning the production and perception of natural speech," the scientists found. Speech synthesizers will play an increasingly important role as communications between man and machine advance, they predicted.

Having added three nasal consonants to the vocabulary of their machine, it can produce essentially all speech sounds occurring in the English language.

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STAINLESS STEEL BOOTS—Developed by the Naval Medical Field Research Laboratory at Camp Lejeune, N. C., the new boots have a six-inch stainless steel "sole" with a "blast deflection" contour wedge to scatter fragments of exploding land mines from the wearer. They are expected to be issued to foot soldiers in 1962.

BIOLOGY

Second-Childhood Joke Justified by Growth

➤ MAN'S GROWTH rate increases again after he passes 70, thus providing some "slight justification" for the second-childhood joke.

The rate of shrinkage is greatest between 60 and 70 years of age, Dr. A. E. Needham of the zoology department, University Museum, Oxford, England, states in Nature, 192:579, 1961.

The shrinkage is slower in the very old, Dr. Needham reports, and the specific growth rate increases again in old age.

"There is direct evidence of this," he said, "in the rate of cell division in some tissues. Other properties also reverse their trend in later life."

Growth in the broadest sense, including maintenance and repair of body tissues, remains positive throughout life, the zoologist explained, although eventually it is unable to keep up with the destruction of tissue that occurs in aging.

Although man's growth increase stops around the age 30, Dr. Needham states, aging, or senescence, is not maximal at the age of 30. There is no discontinuity at that age, for anabolism, the process of assimilation of nutritive matter, continues to decline smoothly.

Dr. Needham started his research to test an old paradox that aging is faster at the beginning than at the end of life.

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SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Astrophysica.—Un studio del composition chimic del particulas que constitue radios cosmic ha essite conducite per Dr. M. M. Shapiro del statounitese Laboratorio de Recerca Naval. Le studio esseva conducite per medio de apparatos portate a extreme altitudes in ballones. Ab le extraordinari frequentia, in iste particulas, del leve elementos lithium, beryllium, e boron, Dr. Shapiro deduce que le radios cosmic ha un antiquitate de milliones de annos. Isto non significo que le radios cosmic habeva lor origine a un correspondente distantia de milliones de annos-lumine proque le curso del radios es repetitiemente curvate per varie campos magnetic in nostre galaxia.

Biochimia.—Dr. M. Calvin del Universitate Californio ha recipite le Precio Nobel pro su recercas in re le phenomeno del si-appellate photosynthese. Ille ha disveloppate le methodo de utilisar carbon radioactive pro traciar le complexe serie de reactiones chimic per le quales le organismo vegetal produce proteinas, saccharos, a altere nutrientes ex aqua, bioxydo de carbon, e le lumine del sol. Successo in le effortio de duplicar iste processo artificialmente haberea sin dubita tremende consequentias economic.

Biologia.—Le processo del invetulation es un phenomeno cytonucleari, i.e., illo occurre in le nucleo del cellula e non in su plasma. Al minus isto vale, secundo Dr. R. W. Siegel del Universitate Caifornia, pro le organismo unicellulari cognoscite como paramecio. Dr. Siegel ha trovate que un vetule paramecio redeveni juvene si su nucleo es reimplaciate microchirurgicamente per le nucleo de un juvene paramecio, mesmo si le resto del cellula hospite remane completemente intacte.

Dieta Militar.—Atherosclerosis es le major causa de morte inter le personal del armea del Statos Unite. Secundo Colonello W. J. Walker del Hospital General Walter Reed a Washington, un recente investigation in varie campos de trainamento militar ha revelate que le soldato statounitese recipe 40% de su calorias in le forma de grassia e que quasi un medietate del grassia es del genere saturate. On sape que grassia saturate es suspecte como agente etiologic (o contributorimente etiologic) in morbo cardiac. Ben que iste connexion non es definitemente provate, Colonello Walker reguarda lo como satis ben documentate pro justificar le recommendation que on modifica le dieta del statounitese fortias armate in favor de caloriferos non grasse e de grassias non-saturate.

Genetica.—Un gruppo de medicos de Syracuse, New York, ha reportate le caso de un par de feminin geminos identic qui, al etate de 79 annos, suffre de sex morbos identic. Istos include anemia perniciose, partial paralyse facial, e benigne tumor mammari.

Geologia.—Dr. W. L. Stokes del Universitate Utah ha publicate le these que le causa principal del lente sed constante ascendita del temperatura terrestre in le curso del passate 11,000 annos es a trovar in le activitates del homine mesme. Le utilisation de foco e etiam le agricultura ha resultate in le liberation de crescente quantitates de bioxydo de carbon in le atmosphera. Isto, secundo Dr. Stokes, age alora como un tecto de vitro que admitte le radiation solar sed trappa le calor producite per illo.

Inventiones.—Esseva patentate un machina capace a reager per un distincte e specific sono al forma characteristic de omne littera individual del alphabeto. Le machina es appellate optophonio per su inventor. Per medio de illo, cecos va poter perciper acusticamente le configurationes de litteras imprimite que nos normales percipe visualmente.

Physica Atomic.—Le Precio Nobel pro le Physica es presentate iste anno a duo investigators del nucleo atomic. Dr. R. L. Mossbauer, currentemente del Instituto Technologic de California, es honorate specificamente pro su discoperta, in 1958, del si-appellate effecto Mossbauer, i.e. del facto que sub certe conditiones il pote occurrer un emission o absorption de radios gamma per le nucleo sin que isto debe suffrer ulle reculamento. Le effecto Mossbauer ha multe importante applicationes theoric e practic. Illo permitte, per exemplo, le propagation de radiationes de frequentia extraordinarimente invariabile.—Le secundo honorato Nobel in Physica es Dr. R. Hofstadter del Universitate Stanford in California qui se ha distinguite per su investigationes in le structura del nucleo atomic, in tanto que illo se revela sub le effecto de varie formas de bombardamento in un accelerator lineari. Secundo le recercas de Dr. Hofstadter le neutron e le proton exhibi remarcabile similaritates structural. Ambes possede un stricte centro de carga electric positive. Iste centro es cingite per duo nubes, diffuse e interpenetrante, que es componite de mesones. In le caso del proton, le duo nubes es ambes positivemente cargate. In le caso del neutron, le un es cargate positivemente e le altere negativemente.

Recercas de Cancere.—In le curso del veniente anno—dice le statisticas—260,000 residentes del Statos Unite va morir ab cancere. Secundo Dr. S. Faber del Universitate Harvard, non plus pue 10,000 de ille 260,000 va haber experientiate le beneficios de un del varie existente cancerotherapias chimic. On sape que le triade therapeutic in uso contra cancere consiste, a generalmente parlar, del radiotherapia, del chirurgia, e del chimotherapia. Le ultimate inter istos, le chimotherapia, es le minus disveloppate. Dr. Faber insiste que le beneficios del chimotherapia anti-cancerose poterea esser multo plus impressionante si drogas (per contrasto con le procedimento nunc in use general) esseva usate non solo teminalmente sed etiam precocemente, i.e. a partir del momento quando le diagnose es establite, e alora preferibilemente in combination con chirurgia e/o radiotherapia.—Quanto al futuro de nostre lucta contra le cancere, Dr. Faber opina que nulle disveloppamentos de importantia fundamental pote esser expectate ab le chirurgia o ab le radiotherapia. Si nos parla del spero de grande conquestas in le campo del cancerotherapia, nos debe pensar primo al chimotherapia, secundo al virologia, e tertio al immunologia.

Recercas de Cancere.—Le uso combinate de tres pharmacos prolongava per inter duo e 11 menses le vita de octo infantes con retinoblastoma (cancere ocular) que se habeva metastatisate ad in le medulla ossee. Iste condition occurre principalmente in infantes de minus que quatro annos de etate. Le tractamento hic reportate esseva initiate per Dr. J. A. Wolff del Universitate Columbia. Le drogas usate per ille esseva un composito de mustarda, un antibiotico, e un antogonista de acido folic.

Virologia.—Dr. A. F. Rasmussen del Universitate California reporta que le virus de influenza asian (le causa de un epidemia mundial in 1957) es multo simile a quatro racias de virus discoperite per ille in animales domestic in Asia. Propone Dr. Rasmussen le theoria que le fonte original del virus de influenza asian es le un o le altere animal domestic (o etiam salvage) de China.

GENERAL SCIENCE

Reading Interlingua

➤ YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

Twenty-three medical journals regularly publish in Interlingua abstracts of their original papers.

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SOCIOLOGY

Family Ties and Housing

➤ PUBLIC HOUSING can be a contributing factor in the family breakdown that often leads to juvenile delinquency.

This was found in a study of families in Puerto Rico that moved from a shack town to public housing, anthropologist Helen M. Icken of Jamaica, N.Y., reported to the American Anthropological Association meeting in Philadelphia.

The status of father, which in shack town surroundings is relatively low and mainly that of the breadwinner, becomes even lower in the public housing environment. Women, who in slum areas generally dominate the family, become even more prominent in the public housing situation because there is less economic need for the man. Rents are very low and repairs and maintenance normally done by the male are now taken over by management.

With the decrease of the male's authority in the family, young boys do not have the strong father-image they can respect and need to set a pattern for themselves. Therefore they turn to their own age group for leadership and authority, which can be beneficial, but often leads to juvenile gangs.

She said the study of 100 families and interviews with 474 persons both from shack town and public housing dwellings showed that many families in the public housing areas were entirely without men. Although the housing project was built to foster a North American middle class environment for the slum population, one result was to increase the importance of the women in the family to the detriment of the man.

In shack town the father was sort of a "supreme court" to whom the women appealed when they could not cope with the situation. In the public housing situation, he was all but pushed out of the picture.

The scientist did the research for the Urban Renewal and Housing Administration of the Commonwealth of Puerto Rico.

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INVENTION

Patents of the Week

➤ A READING MACHINE that translates print into sound signals that blind persons can understand has been patented.

The reading device was developed by John S. Abma of Columbus, Ohio, Lawrence J. Mason of Worthington, Ohio, and David Reagan Rice of Chatham, N.J., who assigned rights of patent No. 3,007,259 to Battelle Memorial Institute, Columbus.

The device, called an optophone, scans a line of printed material and translates the print into a sound signal. It will give the same sound, even for different sizes of print, the inventors claim, thus allowing the blind person to learn to use the instrument more rapidly and to have a wide choice of reading material.

A method of preserving oysters by freezing them in their shell and then separating the meat from the shell won patent No. 3,007,801 for Fernand S. Lapeyre, James M. Lapeyre, Leroy E. Demarest and Robert F. Couret, all of New Orleans, La. After freezing, the oysters are tumbled about until they begin to thaw slightly, in order to break the hinge ligament, to detach the abductor muscle that usually holds the shell tightly shut and to force the shells apart.

The loose frozen meat is then separated from the empty shell. One advantage of this processing, the inventors state, is that individually frozen meat, rather than a frozen block of oyster meat, is available.

A semi-artificial tree with a water supply won patent No. 3,007,282 for Leonard T. Galesky of Stamford, Conn. The method is particularly applicable during the Christmas season, the inventor claims.

His device consists of a hollow base and stand on which tree branches can be mounted. They are watered by osmosis from a saturated wick.

Special dilutions of dithiophosphates as systemic insecticides in mammals won patent No. 3,007,845 for Redginal Irving Hewitt of Nanuet, N.Y., and Emanuel Waletzky of Westwood, N.J. Rights were assigned to American Cyanamid Company, New York.

The carbamoyl alkyl phosphates, administered internally, kill insects and other parasites that feed on or in domestic animals. They are rapidly metabolized in the body of the animal so that the flesh is soon safe for human consumption.

A toothbrush to clean the teeth and massage the gums of domestic animals has been invented by Bird A. Eyer of Seattle, Wash. He received patent No. 3,007,441.

The plastic brush consists of two rows of cylindrical teeth, alternately conical and concave at the tip.

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METEOROLOGY

Nuclear Bombs May Weaken Hurricanes

➤ NUCLEAR BOMBS may be used to take the fury out of hurricanes.

Although the energy of the largest of hydrogen bombs is a fraction of that released by a storm, it may be possible to "damp the storm effects or alter its path" with multiple nuclear blasts, Jack W. Reed of Sandia Corporation, Albuquerque, N. Mex., told the American Meteorological Society meeting in Tallahassee, Fla.

Another way that appears more promising, however, is to explode a bomb of high megaton yield in the eye of the storm. This, theoretically, would push the hot dry air up into the high stratosphere, out of the storm circulation. The colder air, which would then replace the hot air, would weaken the storm intensity.

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TECHNOLOGY

Research Stellarator Made of Stainless Steel

See Front Cover

➤ HALF A MILLION pounds of stainless steel, like that used in kitchens, make up the vault of the C-Stellarator, shown on the cover of this week's SCIENCE NEWS LETTER.

The research device is being used by Princeton University scientists in experiments with hydrogen gas to learn more about thermonuclear reactions similar to those taking place in the sun. Within the vault, ionized gas reaches temperatures of more than one million degrees.

The device was designed by C-Stellarator Associates, an engineering group made up of Allis-Chalmers and Radio Corporation of America personnel.

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EARTH PROBER—Dr. Froelich G. Rainey, director of the University of Pennsylvania Museum, watches progress made by a new high speed drill, originally designed for drilling holes on the moon. It permitted archaeologists to look into buried tombs and buildings in Italy and determine whether excavation was warranted.

PUBLIC SAFETY

Shelters "Inadequate"

➤ THE "DO-IT-YOURSELF" shelter program, urged by some Administration officials and a Nobel prize-winning scientist, is denounced as "ineffective" by Dr. Eugene Rabinowitch, physicist and editor of the Bulletin of the Atomic Scientists, Nov., 1961.

He terms "optimistic" widely publicized estimates that fallout shelters, homemade or otherwise, can assure the survival of 97% of the total population in the event of a heavy nuclear attack.

Fifty percent survival may be "reasonable," but only for "systematically protected populations" with well-organized construction of large, deep and heavily protected stocked shelters in areas not likely to be targets for direct attack. But even with such ideal shelters and the best of planning, the 50-50 survival estimate is uncertain, the atomic scientist states.

Dr. Rabinowitch's estimates for survival and his evaluation of individual shelters are in sharp contradiction to those of Dr. Willard F. Libby, Nobel prize winner and former chairman of the Atomic Energy Commission, who recently stated that "90% to 95% of us survive with proper protection."

According to Dr. Libby, a $30 investment in burlap bags, nylon string and needle to sew bags, railroad ties, trucking in the ties, and zinc chromate to treat the burlap bags, plus an individual's own labor, can build a four-by-six-foot enclosure, five feet high, that will give a family "100 times more chance of surviving."

Dr. Rabinowitch takes the view that: "Haphazard construction of shelters by individual citizens hoping to assure their own and their families' survival in a general holocaust will neither protect them nor help the country as a whole. It only leads to such demonstrations of human depravity as the present discussions of whether a shelter owner will have the legal and moral right to shoot his neighbors or machine gun fleeing refugees trying to invade his shelter or raid his food supplies."

The maximum possible protection of civilian population and the improvement of chances for resumption of national life after a nuclear attack require Federal planning. "Leaving it to state and local authorities or to individual householders is a dereliction of duty," Dr. Rabinowitch believes.

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ASTRONOMY

50 Years of Astronomy

➤ EINSTEIN'S THEORY of relativity leads the most important astronomical advances of the past 50 years, Dr. Harlow Shapley, retired director of Harvard College Observatory, believes.

The second most important advance after Einstein's relativity theory, Dr. Shapley said, may surprise many, including astronomers. It is the 11-volume Henry Draper catalogue of stars. This monumental work became the foundation on which many great advances in man's understanding of the universe are based.

Among the major developments of recent years, Dr. Shapley cited the epochal advances in engineering and instrumentation that have had far-reaching effects on astronomy. These include the development of large reflecting telescopes, of which the world's largest is the 200-inch Hale telescope atop Mt. Palomar, Calif., and its predecessors, such as the 100-inch at Mt. Wilson, Calif.

Other instrumental advances include:

1. The invention of the coronagraph, allowing study of the sun's outer halo at times other than when the sun's bright light is cut off by the moon during a solar eclipse.

2. The development of wide-eyed Schmidt telescopes.

3. The application to astronomy of highly sensitive photographic emulsions and of TV-like techniques to permit shorter photographing time of heavenly objects.

4. The discovery and wide use of radio astronomy, by which the radio waves broadcast by the sun, planets and stars as well as invisible objects in space are detected and analyzed to give a broader picture of the universe.

5. The application of electronic computers to astronomy, including the prediction of the positions of planets during the next 400 years, as well as in stellar structure and astrophysics.

The fall of the Tunguska meteorite in Siberia on June 30, 1908, which produced one of the biggest "bangs" of this century, was among the top highlights in astronomy during the 20th century, Dr. Shapley said.

He pointed out that only within the past 50 years had the sun and its planets been displaced from the center of the Milky Way galaxy to which they belong. They are now known to be located in a spiral arm far from the Milky Way's center. Likewise only in this century did astronomers discover that the fuzzy objects known as spiral nebulae were actually galaxies far away from the Milky Way, each consisting of billions of stars shining by their own light.

Dr. Shapley said the idea that the universe is expanding, with the untold numbers of galaxies flying away from each other at speeds approaching one-half that of light, came from studies of stellar light first made by Dr. Milton L. Humason. However, he reported, there is still no agreement among astronomers concerning the origin of the universe.

The three current theories, each with their own proponents, Dr. Shapley termed the "big bang," the "bang-bang" and the "no-bang," for a universe that is exploding, alternately exploding and contracting and exploding, and in a steady-state, respectively.

One very valuable clue concerning how stars develop, Dr. Shapley said, is known as the Hertzprung-Russell diagram. This shows the relationship of a star's color to its brightness, and also helps to estimate the distances of stars.

The Cepheid variables are an aid in finding the distances to stars, and thereby the size of the universe, Dr. Shapley told the amateur astronomers. These stars pulsate, growing alternately brighter and dimmer, and the time it takes them to go through a full cycle is an indication of how far they are from the solar system.

Two other astronomical advances of the last 50 years, Dr. Shapley reported, were the discovery that the relatively dark spots seen on the sun's surface have magnetic fields, and the finding of Pluto, the sun's outermost planet more than three and a half billion miles from the earth.

Although better measurements of the earth's distance from the sun (the astronomical unit) have since been made, Dr. Shapley said that an outstanding example of international cooperation was the determination of this distance in 1931 by astronomers from 15 countries, who carefully observed the close approach of the tiny asteroid known as Eros.

The new values for the astronomical unit are based on observations of radar waves reflected from the planet Venus. Radio wave observations also show, Dr. Shapley said, that Venus is too hot—more than 600 degrees Fahrenheit—for any known form of life. However, he pointed out, the puzzle of whether Mars could support even a primitive form of life is still not solved.

Dr. Shapley pointed out that the founding of the American Association of Variable Star Observers 50 years ago was also one of the highlights of astronomy in the 20th century. He noted that amateur astronomers had made many important contributions to the understanding of the world around us.

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AGRICULTURE

Instruments Measure The Quality of Food

➤ MACHINES are now displacing humans in another field—that of quality measurement of foods. Scientists in the Agricultural Marketing Service of the U. S. Department of Agriculture are using machines to find out the redness of a tomato, the amount of fat in commercial beef, and how much mold there is in corn.

Other instruments judge the maturity of apples by measuring the light transmitted by the sample. A still unnamed mechanism detects various quality defects in foods.

All these developments, which measure objectively food quality without destroying the sample, will help assure the consumer of better products in the market.

• Science News Letter, 80:350 November 25, 1961

ZERO GRAVITY BELT—Scientist Ralph E. Flexman tests under zero gravity conditions a belt that will enable men to leave orbiting space vehicles to perform inspection, repair and assembly tasks in space. The belt is being developed by Textron's Bell Aerosystems Company, Buffalo, N. Y.

SPACE

Chimp Will Play in Space

A CHIMP will soon take a ride around the earth, playing with flashing lights and levers and not worrying what it is all about.

His main concern will be to carry out the tasks of the 70-minute program he has been taught to perform here on earth. This includes rest periods, rewards consisting of sips of water and banana-flavored pellets if he does his job. The chimp will be launched from Cape Canaveral.

His "job" will be to work with levers and display panels with colored lights. In most tasks he will react to colored lights by hitting the appropriate lever under the light. One task includes three symbols, two of which are alike. He must be able to indicate which symbol is different.

All the tasks were designed for the first orbiting chimp in order to check whether his mental and physical capabilities are as good during the flight as when his feet are on the ground.

The lucky fellow to ride from one to three times around the earth in the Mercury capsule will be chosen from five chimps who have been in training for the flight.

All are four years old, weigh 40 pounds and include the veteran astro-chimp, Ham, who went on his first space flight Jan. 31, 1961, on the Mercury-Redstone-II rocket. The rocket traveled 155 miles into space.

If the chimps do not respond to their jobs, or are lazy, they will be given a "hot-foot" in the form of a mild shock in the left foot as, what the psychologists call, a "negative reinforcement." However, the National Aeronautics and Space Administration reported that the chimps in training have not needed this very often.

The orbital chimp flight, the first United States flight around the earth with a living being, will be handled as carefully as the suborbital flights of the first two U.S. astronauts.

The chimp will wear the equivalent of an astronaut's space suit. He will be protected in a pressure-tight metal and plastic box connected to an environmental system like the one to which the astronaut's suit was connected. His heart rate, blood pressure, breathing and temperature will be measured during the flight by 18 ground stations around the world. Medical personnel will be present at all these stations during the flight.

The MA-5 flight will last four and one half hours if the chimp circles the earth three times. He will be flying 100 to 150 miles above the earth. The chimp would land in the Atlantic Ocean near Bermuda after one orbit or about 1,000 miles southeast of Cape Canaveral if the chimp makes three orbits.

During the flight the chimp will be given pure oxygen, and he has an escape hatch on the side of his capsule if anything goes wrong. Since he cannot talk, recorded tapes will talk to him during the flight to test out voice communication. Four separate cameras will take pictures of his actions.

• Science News Letter, 80:351 November 25, 1961

ASTRONOMY

Promising Comet Seki Disappoints Astronomers

COMET SEKI, expected to become as bright as Halley's comet, has disappointed astronomers. (See SNL, 80:304, 1961.)

Halley's famous comet appeared in 1910 as a first magnitude object, which is as bright as the brightest stars in the heavens. Comet Seki has been observed as only fifth magnitude, Dr. Elizabeth Roemer of the U.S. Naval Observatory, Flagstaff, Ariz., told SCIENCE SERVICE.

This is just visible to the naked eye under good seeing conditions. However, Dr. Roemer said the comet may actually have brightened to fourth magnitude at times when it could not be observed.

The astronomer has observed Seki from the time it appeared, and has photographed it with the 40-inch reflecting telescope at Flagstaff. She said the comet had a tail several degrees long on Oct. 21, ten days after its discovery by a Japanese amateur astronomer. When last observed at Flagstaff on Nov. 11, Seki had become a faded blob trailing a few streamers, the remnants of the tail, she said.

Seki, which was expected to have reached its greatest brightness as it came closest to earth, 12,000,000 miles away, on Nov. 14, moved south rapidly and could be seen only from the Southern Hemisphere after that time.

However, by the end of November it is expected to be visible from the United States again, although it will now have faded even further and be about seventh or eighth magnitude, Dr. Roemer said. At that brightness it can barely be seen with binoculars but will be visible through small telescopes.

Dr. Roemer said comet Seki will continue to move away from the earth and by mid-January it will be difficult to observe even with very large telescopes.

• Science News Letter, 80:351 November 25, 1961

GEOLOGY

Tiny Plant Grains Lead Scientists to Oil

ANCIENT SPORES and pollen grains are valuable tools to the oil industry as indicators of oil-bearing rocks.

Palynology, the study of fossil spores and pollen, has gained impetus in oil research since World War II, according to Dr. Aureal T. Cross, professor of geology at Michigan State University, East Lansing, Mich.

These tiny reproductive cells of plants, which are spread by wind and water, are used to reconstruct geologic landscape and the extent of ancient seas. This helps geologists understand the formation and discovery of oil deposits.

The major reason for the studies being conducted by many oil companies is the abundance of these fossils, which are small and well protected as compared to remains of large plant parts, he said.

• Science News Letter, 80:351 November 25, 1961

SPACE

U.S. Moon Flight Center To Be Built at Houston

➤ A GREAT new center charged with getting man on the moon will rise at Houston, Texas, costing $60,000,000.

The manned space flight laboratory will be used to design, develop, evaluate and test the craft for Project Apollo, train the crew that will fly the Apollo missions, and control the lunar mission.

There will be a flight project facility, an equipment evaluation laboratory, a flight operations facility and an environmental testing laboratory.

Missiles fabricated at the Michoud Plant near the mouth of the Mississippi River at New Orleans and spacecraft tested at the new Houston center can be shipped by deep water transportation to the proposed expanded Atlantic Missile Range at Cape Canaveral, Fla., from which the spaceships will be launched.

• Science News Letter, 80:352 November 25, 1961

TECHNOLOGY

Future Clothing May Be Made of Steel

➤ GARMENTS made of steel may be standard items in clothing stores of the future, a scientist has predicted.

This does not mean that everyone will be wearing armor plate. Dr. Henry E. Millson, American Cyanamid Company textile chemist, said soft, drapable fabrics may be woven from stainless steel wire so fine-drawn that it is only one-half the thickness of a human hair.

Dr. Millson also envisions aluminum-coated summer clothing to keep the wearer cool, and winter clothing with inner linings that can be removed to collect solar energy for warmth.

He added that knitted and woven paper garments, treated with resins and finishes so they can be washed and dry cleaned, may be "the answer to the clothing problem in low-income countries."

Resin-treated paper can be knitted, and already is being used to make hats for women.

• Science News Letter, 80:352 November 25, 1961

PUBLIC HEALTH

Blankets Not Guilty Of Spreading Staph

➤ FLUFF FROM WOOLEN blankets is not the major culprit responsible for spreading bacterial infections throughout an entire hospital, the Australian Commonwealth Scientific and Industrial Research Organization concludes.

Studies conducted by T. A. Pressley of CSIRO revealed that in Melbourne hospitals, at least, wool fibers comprise only ten percent of the fibers floating around rooms and corridors. The rest are cotton and other forms of cellulose.

This is not so surprising, Mr. Pressley states, because wool fibers are roughly cylindrical and probably do not float well. But cotton and other cellulose fibers are ribbon-shaped and should ride air streams relatively well.

In any case, the bacteria travel around very well without hitch-hiking rides on fibers. From floor level to nine feet up, bacterial growth on culture plates exposed to the air was about equal, indicating that bacteria are evenly distributed about the room. Fibers, on the other hand, rarely floated higher than six feet.

In a final test, Mr. Pressley reports in Rural Research in CSIRO, a harmless, bright yellow marker bacterium related to the more troublesome *Staphylococcus aureus* was used to trace the spread of infection. A bed covered with pure woolen blankets was deliberately contaminated with the marker organism, and at a later date, the same test was run using cotton blankets.

The organism spread to every other bed in the ward within a few hours regardless of the type of blanket originally contaminated. But fewer spread from the woolen blanket than from the cotton. And even fewer still were spread when the woolen blanket was left uncovered by a counterpane.

• Science News Letter, 80:352 November 25, 1961

PUBLIC HEALTH

Super-City Pollution Is Modern Age Plague

➤ THE UNITED STATES is suffering from the era of the super-city where the air is burdened annually with the waste products of more than 40 billion pounds of synthetic organic chemicals.

Dr. Richard A. Prindle, deputy chief of the U.S. Public Health Service's air pollution division, told the Annual Conference of the Philadelphia Tuberculosis and Health Association that the threat to health from polluted air is not just limited to the super-cities. Masses of air pollution are carried from urban centers to vegetation and animal life literally hundreds of miles away from the source.

Heavy pollution of waters by cities also affects the quality of waters out in the country, he noted. Damage to the needles of trees in the remote pine forests have been traced to city-produced air pollutants.

The filthy air and polluted streams cost annually $7.5 billion in damage to vegetation, livestock, corrosion and soiling of materials and structures, interference with visibility, and depression of property values. Evidence indicates that air pollution is linked with increased mortality from cardio-respiratory causes, increased susceptibility to respiratory diseases, and interference with normal respiratory function, the U.S. Public Health Service official said.

Currently only 15 states have comprehensive air pollution control legislation. More control is needed throughout the nation. "We know how to control or prevent the great majority of air pollution emissions, but the equipment and technical knowledge available are not being applied," Dr. Prindle said. "The total job will require active participation by all levels of Government and by private organizations."

• Science News Letter, 80:352 November 25, 1961

IN SCIENCE

SEISMOLOGY

Rusty Cable on Ocean Bottom to Save Lives

➤ AN ABANDONED cable rusting away on the ocean bottom will soon help save lives from earthquake-generated sea waves.

Hawaiian Institute of Geophysics scientists will attach a "tide gauge" to a communications cable that once linked Hawaii to the United States mainland. The pressure gauge will warn the Islands when a tsunami, sometimes incorrectly called tidal wave, is heading their way.

The 400-mile long cable will be hoisted to the surface, the pressure gauge added, and then lowered in several hundred feet of water. The instrument will measure the height of the wave by deep-sea changes in pressure. The information is then sent back to the island over the cable.

"The data will be used to supplement the present U.S. tsunami warning network," Dr. Leonard M. Murphy, chief of the U.S. Coast and Geodetic Survey's seismology branch, said. The Survey maintains a seismological-tidal gauge network that tells scientists when a tsunami is forming. A warning is sent to all islands and coastal areas in the wave's path, informing them when it will strike.

The submarine cable has been rusting away on the ocean bottom since a new cable linking the Islands and the U.S. continent was laid down about 30 years ago.

• Science News Letter, 80:352 November 25, 1961

EDUCATION

Grants for USSR Trip Open to U.S. Scholars

➤ ADVANCED AMERICAN scholars who want to spend "all or part" of the 1962-63 school year in study and research in the Soviet Union have until Dec. 15, 1961, to file an application, the Inter-University Committee on Travel Grants has announced.

Grants are available to college and university graduate students, post-doctoral researchers and faculty members from all fields, plus Russian language teachers in high schools. Applicants must be less than 40 years old and emotionally stable. They must have "a knowledge of Russian adequate to (study and research) needs."

Under an academic exchange program, the committee has sent 66 American graduate students and young faculty members to the Soviet Union since 1958. Another 38 will go during the 1961-62 year. An equivalent number of Soviet students have studied or will study in the United States.

Inquiries should be sent to Stephen Viderman, the committee's deputy chairman, at 719 Ballantine Hall, Indiana University, Bloomington, Ind.

• Science News Letter, 80:352 November 25, 1961

E FIELDS

PUBLIC HEALTH

Water Pollution Menaces Soviet Health

➤ WATER POLLUTION is plaguing the Soviet Union and is a serious threat "not only to human health, but . . . to the entire national economy," according to a report in the USSR public health journal, Hygiene and Sanitation.

Major sources of pollution in the USSR are oil refineries, the chemical and rubber industries, Soviet mining and metallurgical enterprises, paper manufacturers and ordinary sewage.

The pollution problem is due to the failure of legally regulating the use of water resources on a nation-wide basis or planning protective policies, Russian authorities stated in the journal.

At the present time, "each plant or each industry utilizes its water facilities on an individual—purely local—basis, guided solely by its own particular needs," the proceedings of a commission convened by the USSR Ministry of Health revealed.

Soviet water problems were made known in the United States by a U.S. Public Health Service survey of Russian literature on water supply and pollution control.

• Science News Letter, 80:353 November 25, 1961

PSYCHIATRY

Memories Leave Fine Trace in the Brain

➤ SCIENTISTS looking for traces of memories in the brain should use a scale millions of times finer than they have been using.

Instead of looking on the level of nerve cells, they should look on the molecular level, scientists learned at a New York State divisional meeting of the American Psychiatric Association in New York.

Memories should be measured in angstroms, rather than in millimeters, Dr. Hans-Lukas Teuber, Massachusetts Institute of Technology psychologist, told the meeting. By looking on too large a scale, psychologists have missed the physiological evidence altogether. In fact, Dr. Teuber said, those who teach are pretty well convinced that learning or memory sometimes does not actually take place at all.

Dr. Linus Pauling, 1954 Nobel prize winner in chemistry, also indicated that memory may be a matter of chemistry or electricity rather than establishment of nervous pathways.

There are two kinds of memory, both psychologist and chemist agree. There is a recent or ephemeral memory that is easily destroyed or impaired by a blow on the head, convulsions, electric shock, or by certain chemicals such as anesthetics.

After a time these recent memories become consolidated into "permanent" memories that are much less vulnerable to damage or loss.

Dr. Teuber is now conducting experiments in which attempts are being made to "overtake" a memory process during consolidation by injecting chemical substances. In this way, it is hoped to induce selective losses of recently acquired material without the drastic general effects of concussion, general anesthesia or electroshock-induced convulsions.

• Science News Letter, 80:353 November 25, 1961

ENGINEERING

Tests Uphold 70-Year Old Formula for Water Flow

➤ THE FORMULA for flow of water in open channels and pipes developed by an Irish engineer, Robert Manning, in 1891, and used by civil and hydraulic engineers ever since, is still about as good a formula as can be used.

This has been shown by extensive tests at the Rocky Mountain Hydraulic Laboratory at Allenspark, Colo., which uses a crystal-clear mountain stream fed by melting snow for its experiments.

The tests were made under a grant from the National Science Foundation, administered by the Colorado State University.

A 400-foot adjustable-slope triangular flume was tested smooth and also roughened with small rectangular battens at various spacings. Manning's formula, which is found in the engineering text books, gave about as good results as a logarithmic formula that was worked out of the results of the test.

The engineers who did the tests were Ralph W. Powell, emeritus professor of engineering mechanics, Ohio State University, and Chesley J. Posey, director, Rocky Mountain Hydraulic Laboratory, and head, department of civil engineering, State University of Iowa.

• Science News Letter, 80:353 November 25, 1961

PHARMACOLOGY

Drugstore Antiseptic Outranks Oral Iodine

➤ A NON-PRESCRIPTION drugstore product outranked a new oral iodine in destroying germs commonly found in the mouth.

Chloraseptic, a spray-and-swallow solution marketed by a Washington, D.C., firm, was applied to 40 mouth areas before a needle injected local pain-killing drugs prior to dental or oral surgery. Bacteria were recovered from only one needle. Multiple injections occurred in 35 cases.

When povidone-iodine was used, only five out of 115 injection needles had bacteria.

Drs. Doran D. Zinner, James M. Jablon and Milton S. Saslaw of the University of Miami and National Children's Cardiac Hospital, Miami, Fla., report the findings in the Journal of Oral Surgery, Oral Medicine and Oral Pathology, Nov. 1961.

• Science News Letter, 80:353 November 25, 1961

MEDICINE

New Hospital Technique Curbs "Staph" Infections

➤ A SIMPLE new hospital technique has effectively curbed "staph" infections in hospital nurseries for a 20-month period.

A key part of the technique involves washing all infants immediately after birth and daily thereafter with a hexachlorophene solution. The technique keeps the staphylococcus germs from reaching the skin of the infants.

The method has been tried at two hospitals with excellent results, Dr. Sumner J. Yaffe, assistant professor of pediatrics at Stanford University School of Medicine, told a meeting of the Western Society for Pediatric Research in San Francisco. Co-author of the report is Dr. Harold J. Simon, assistant professor of medicine and medical microbiology at Stanford.

"Staph" germs have caused epidemics and in some cases several deaths in hospital nurseries in the United States and abroad. They are the chief cause of infection in maternity units.

• Science News Letter, 80:353 November 25, 1961

MEDICINE

Eye Cancer Cases Helped Through Drug Treatment

➤ CHILDREN with eye cancer that has spread to other parts of the body have received a new lease on life through drug treatment.

Eight children suffering from eye cancer that had spread to the bone marrow lived from two to 11 months longer after treatment with a combination of three drugs, Dr. James A. Wolff of the Columbia University College of Physicians and Surgeons, New York, said. The eye cancer strikes children under four years of age.

The child who lived longest—11 months after the diagnosis of spreading cancer had been made—was treated with Cytoxan, a mustard compound; actinomycin D, an antibiotic; and methotrexate, a folic acid antagonist, first used in the treatment of leukemia.

For years, Dr. Wolff said, physicians did not know that retinoblastoma (eye cancer) spread. In 1948, when he first came to Columbia University, he found one patient who had this condition but it was not until two years ago that he began serious work in screening children to find cases in which the eye cancer had spread.

Out of 24 children with retinoblastoma he found the eight who responded to drug treatment, Dr. Wolff told the second conference on Experimental Clinical Cancer Chemotherapy in Washington, D. C.

"Here was a lead to an involvement we did not suspect," Dr. Wolff said, adding that he saw hope for longer survival as research progressed. "It looks as though triple therapy would offer most promising results," he said.

Eighty percent of the children with retinoblastoma confined to the eye alone survived five years.

• Science News Letter, 80:353 November 25, 1961

ASTRONOMY

Impressive Stellar Display

Brilliant winter constellations shining on December evenings include Orion, Canis Major and Taurus. The planets Jupiter and Saturn are visible early, James Stokley reports.

➤ WITH THE ARRIVAL of December the brilliant constellations of the winter evening are now in full view. Orion and his neighbors, which occupy a region of the sky that has more bright stars than any other area of similar size, shine in the southeast, as shown on the accompanying maps.

These depict the heavens as they look about 10 p.m., your own kind of standard time, at the first of December, an hour earlier at the middle of the month and two hours earlier at the end.

A good place to start is with the three stars in a row (now nearly vertical) that form the belt of the warrior, which is the way that Orion was pictured on the old star maps. These stars are high in the southeast. To the left, and a little higher, is Betelgeuse, while brilliant Rigel is to the right and below the belt.

Directly below Orion is Lepus, the hare, a relatively faint group, but to the left of this creature is Canis Major, the great dog, with the star called Sirius. It is also known as the dog star, and is the brightest star that we can see in the nighttime sky. Even though its present low altitude causes considerable reduction in its light on account of absorption in the atmosphere, Sirius still shines with great splendor.

Canis Minor Stands in the East

Over toward the east, a little higher than Sirius, is Procyon in Canis Minor, the little dog. And above this group is the constellation of Gemini, the twins, in which are two bright stars, Castor and Pollux. (These appear on the map of the northern sky.)

Above Orion is Taurus, the bull, with the bright star Aldebaran (red in color) marking the animal's eye. To the left of Taurus (also on the northern sky map) is Auriga, the charioteer, with Capella as the brightest star.

Low in the northwest is Vega, about all that is now visible of the constellation of Lyra, the lyre. Vega is of the first magnitude—the brightest—but its low altitude causes a diminution of its light, as with Sirius. Similarly dimmed is Deneb, in Cygnus, the swan, which is above Vega.

Directly north, about half way from the horizon to the zenith, is Polaris, the pole star, which is part of Ursa Minor, the little bear. Ursa Major, the big bear, is a little lower and to the right, in a poor position, as it always is at this time of year. But higher than Polaris, and toward the left, you can see Cassiopeia, the queen, whose five main stars now form a letter M.

Andromeda, who was Cassiopeia's daughter according to mythology, is above her mother. Directly overhead stands Perseus, the champion, who rescued the princess when she was chained to a rock and a sea monster was about to devour her. The star marked Algol is not notable for its brightness, but because it is a famous variable star. Every 2 days 21 hours, approximately, it fades to about a third of its normal brightness, taking about five hours to dim and about five more to return to its original state. Actually, there are two stars, one dark, which regularly passes in front of its bright companion and partially eclipses it.

No planet is visible in December at the times for which the maps are drawn, but earlier in the evening—until about three hours after sunset—Jupiter shines brightly in the southwestern sky. It is in the constellation of Capricornus, the horned goat. This is next to Aquarius, the water carrier, which does appear, low in the west. Saturn, considerably fainter, is lower and farther to the right. It sets about half an hour earlier.

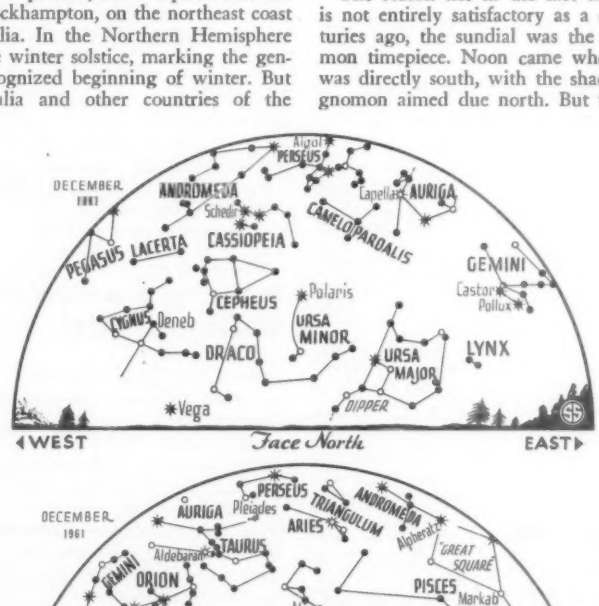
On Thursday, Dec. 21, at 9:20 p.m. EST (8:20 CST, 7:20 MST and 6:20 PST), the sun reaches its farthest south for the year. At this moment it will be directly over the Tropic of Capricorn, above a point near the city of Rockhampton, on the northeast coast of Australia. In the Northern Hemisphere this is the winter solstice, marking the generally recognized beginning of winter. But in Australia and other countries of the Southern Hemisphere it is the beginning of summer.

On Dec. 21, as seen from the U.S., the sun rises far to the south of the eastern point of the horizon. Similarly, it sets well to the south of due west. Its noon-day height is the lowest of the year. Consequently it has only a short path above the horizon, and a long one below, which means that this is the shortest day of the year, and the longest night.

Knowing this, you might suppose that on the 21st the sun would rise later than any other day, and set earlier. But it does not! The earliest sunset comes from Nov. 30 to Dec. 13. Then, at 40 degrees north latitude, it sets at 4:35 p.m. if you are on the central meridian of your time zone. (That is, at 75 degrees west longitude for Eastern time, 90 degrees for Central, 105 degrees for Mountain and 120 degrees for Pacific.) To the west of these meridians, by your watch, it would be later; to the east, earlier. On Dec. 21, the sun sets at 4:38 p.m., and rises at 7:18 a.m.

The latest rising, at 7:22 a.m., comes from Dec. 30 to Jan. 11, when the sun sets from 4:43 p.m. to 4:55 p.m. In other words, the earliest sunsets come several days before the solstice, while the latest sunrises come several days later. Why?

The reason lies in the fact that the sun is not entirely satisfactory as a clock. Centuries ago, the sundial was the most common timepiece. Noon came when the sun was directly south, with the shadow of the gnomon aimed due north. But the sundial



sometimes runs fast, sometimes slow, because of the way the earth revolves around the sun. It indicates what is called apparent time. As clocks came into use, "mean" time was introduced, which is based on an average, or mean sun, that does run at the same rate throughout the year.

At the beginning of November, mean time is about 15 minutes slow compared to apparent time; that is, the sun is 15 minutes early. After that—during December—the clock gains rapidly on the sundial. In mid-February, the sun will be almost 15 minutes late. The difference between mean and apparent time is called the "equation of time"; it is the number of minutes and seconds that you must add to or subtract from the mean time indicated by the clock to get the corresponding apparent or sundial time.

On Dec. 6, approximately midway in the earliest sunset period, the equation of time is plus 9 minutes 11 seconds; on Dec. 21, plus 2 minutes 10 seconds, and on Jan. 5, approximately midway in the latest sunrise period, minus 5 minutes 6 seconds. Now let us alter the times of sunrise and sunset on these dates to give it in apparent time, and we have:

	Sunset	*Sunrise*
Dec. 6	4:44 p.m.	7:16 a.m.
21	4:40 p.m.	7:20 a.m.
Jan. 5	4:44 p.m.	7:17 a.m.

Now the latest sunrise and the earliest sunset do occur on the shortest day—the day with the least time between the sun's rising and setting.

In other words, the sun performs according to its own kind of time, not the arbitrary and artificial kind of time that man has found most convenient to regulate his activities.

Celestial Time Table for December

Dec.	EST	
5	2:02 a.m.	Algol (variable star in Perseus) at minimum brightness
7	6:52 p.m.	New moon
	10:51 p.m.	Algol at minimum
10	7:00 p.m.	Moon passes Saturn
	7:40 p.m.	Algol at minimum
11	9:00 a.m.	Moon passes Jupiter
	7:00 p.m.	Moon nearest; 228,900 miles from earth
13	early a.m.	Meteors seen radiating from constellation of Gemini
14	1:00 p.m.	Mars behind sun
	3:06 p.m.	Moon in first quarter
16	3:00 a.m.	Mercury behind sun
21	7:42 p.m.	Full moon
	9:20 p.m.	Sun farthest south; winter commences in Northern Hemisphere
25	3:46 a.m.	Algol at minimum
27	2:00 p.m.	Moon farthest; 251,500 miles from earth
28	12:35 a.m.	Algol at minimum
29	10:57 p.m.	Moon in last quarter
30	9:24 p.m.	Algol at minimum

Subtract one hour for CST, two hours for MST, and three hours for PST.
MST, and three hours for PST.

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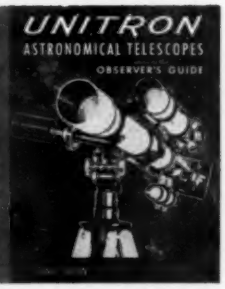

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• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

BELOVED BOTANIST: The Story of Linnaeus—Adrien Stoutenburg and Laura Nelson Baker—*Scribner,* 192 p., illus., $2.95. Biography for young people.

THE BIG GAME ANIMALS OF NORTH AMERICA—Jack O'Connor, with Natural Histories by George G. Goodwin—*Outdoor Life (Dutton),* 264 p., illus. by Douglas Allen, $10; $8.50 until 1/1/62. From Alaskan Dall sheep to the walrus, this book describes big game wildlife from the hunter's and from the naturalist's viewpoints.

THE BIOSYSTEMATICS OF AMERICAN CROWS—David W. Johnston—*Univ. of Wash. Press,* 119 p., graphs, $3.25. Study of the characteristics of American crows as they relate to their geographic range, habitat choice, voice, and other ecological differences.

CARBON-14 AND OTHER SCIENCE METHODS THAT DATE THE PAST—Lynn and Gray Poole—*Whittlesey House,* 160 p., illus. by P. A. Hutchison, $3.50. Tells young people about radiocarbon dating, thermoluminescence and dating by obsidian, and what these methods have brought to light.

THE CLOUD FOREST: A Chronicle of the South American Wilderness—Peter Matthiessen—*Viking,* 280 p., photographs, maps, $6.50. An intimate picture of life in the wilderness of the Andean sierra, Tierra del Fuego, Mato Grosso and the jungles of Peru.

A DIRECTORY OF SAFETY FILMS—Accident Prevention Committee, Bruce W. Everist, Chmn.—*Am. Acad. of Pediatrics,* 79 p., paper, single copies free upon request directly to publisher, 1801 Hunman Ave., Evanston, Ill. Describes safety films for adults and children, and lists sources.

DOLPHINS: The Myth and the Mammal—Antony Alpers—*Houghton,* 268 p., illus. by Erik Thorn, $5. Fables, true experiences and biological facts about these gentle and remarkably intelligent marine animals.

EQUIPMENT AND SUPPLIES: Tested and Approved for Pre-School, School and Home—Alida H. Hisle, Ed.—*Assn. for Childhood Educ.,* 116 p., illus., paper, $1.50. Revised list.

EVOLUTION AND CHRISTIANS—Philip G. Fothergill—*Longmans,* 395 p., illus., $9.50. Catholic biologist's balanced account of the classical evidence of organic evolution and of modern evolutionary theory.

EVOLUTION OF THE VERTEBRATES: A History of the Backboned Animals Through Time—Edwin H. Colbert—*Science Editions,* 479 p., illus., paper, $2.45. General review of vertebrate evolution as based on the fossil record, for student and layman. Reprint.

GUIDE TO CAMPSITES — *Camping Family (Hammond)* 382 p., illus., maps, $3.95; paper, $2.50. Indexed, state-by-state information on national, state and local parks, forests and recreation areas.

HAMMOND'S AMBASSADOR WORLD ATLAS—*Hammond,* 2nd ed., 500 p., 480 maps, $15; $13.50 before Christmas. Family atlas, 60th anniversary edition, up-to-date physical and political maps, gazetteer of cities, latest census figures used, basic facts on solar system.

HANDBOOK OF CHEMISTRY AND PHYSICS: A Ready-Reference Book of Chemical and Physical Data—Charles D. Hodgman, Robert C. Weast and Samuel M. Selby, Eds.—*Chemical Rubber Pub. Co.,* 43rd ed., 3513 p., $12. Revised standard reference, classified under five indexes.

HOW TO DISSECT: Exploring with Probe and Scalpel—William Berman—*Sentinel Bks.,* 127 p., illus., paper, $1. Beginner's guide to dissecting frog, flower and other specimens.

I.G.Y.: The Year of the New Moons—J. Tuzo Wilson, foreword by Lloyd V. Berkner—*Knopf,* 359 p., illus., $5.95. Combines a record of the scientist's world-wide journeys with an account of the scientific work accomplished by this great international cooperative effort among scientists.

THE INEXHAUSTIBLE SEA—Hawthorn Daniel and Francis Minot—*Collier Bks.,* 192 p., paper, 95¢. First published in 1954, about marine life and ocean research.

THE INQUIRING MIND—Cyril O. Houle—*Univ. of Wis. Press,* 87 p., paper, $1.50. A study of the adult who continues to learn.

THE INTERPRETATION OF DREAMS—Sigmund Freud, transl. from German and ed. by James Strachey—*Science Editions,* 692 p., paper, $1.95. Originally published in 1955.

AN INTRODUCTION TO THE ELEMENTS OF MATHEMATICS—John N. Fujii—*Wiley,* 312 p., $6.25. First year college course designed to teach mathematics as a branch of human culture.

IS THERE A FUTURE SCIENTIST OR ENGINEER IN YOUR HOME: A Guidebook for Parents—*Battelle Memorial Institute,* 30 p., illus., paper, single copies free upon request direct to publisher, Public Service, Columbus 1, Ohio. To help parents discover and encourage scientific talent.

ISHI IN TWO WORLDS: A Biography of the Last Wild Indian in North America—Theodora Kroeber, foreword by Lewis Gannett—*Univ. of Calif. Press,* 255 p., photographs, $5.95. Story of the last of the Yahi Indian tribe in California, living Stone Age man in the 20th century.

THE LOGIC OF SCIENTIFIC DISCOVERY—Karl R. Popper—*Science Editions,* 480 p., paper, $2.45. Reprint of 1958 English edition.

THE LONG, LONELY LEAP—Captain Joseph W. Kittinger, Jr. with Martin Caidin—*Dutton,* 249 p., photographs, $4.95. Personal story of the record parachutist who jumped from almost 20 miles above the earth.

MCGRAW-HILL ENCYCLOPEDIA OF RUSSIA AND THE SOVIET UNION—Michael T. Florinsky, Ed.—*McGraw,* 624 p., illus., $23.50. Attempts to present concise, up-to-date and objective information on Russia. Articles written by qualified American experts, such as coverage of mathematics by Saul Kravetz, medical system by Mark G. Field and physics by John Turkevich.

MAN, TIME AND FOSSILS: The Story of Evolution—Ruth Moore—*Knopf,* 2nd rev. ed., 499 p., illus. by Sue Richert, photographs, $6.95. Enlarged edition incorporates the latest finds of human species in East Africa.

A MODEL OF THE MIND: Explored by Hypnotically Controlled Experiments and Examined for Its Psychodynamic Implications—Gerald S. Blum and others—*Wiley,* 229 p., illus., $6.95. Describes experiments designed to explore those mental functions between stimulus and response.

1961 PROCEEDINGS OF THE INSTITUTE OF ENVIRONMENTAL SCIENCES—Arthur Billet, Chmn.—*Inst. of Environmental Sciences,* 684 p., illus., paper, $12. Technical papers on simulation methods, ground, marine, thermal and space environments, spacecraft and vibration problems.

ON GROWTH AND FORM—D'Arcy Wentworth Thompson; abridged by John Tyler Bonner—*Cambridge,* 346 p., illus., $5.95. Shorter version of work analyzing biological processes in their mathematical and physical aspects.

PIONEERING IN SPACE—Walter B. Hendrickson, Jr.—*Bobbs,* 256 p., illus. by Jack Russell, $3.50. Elementary introduction to the U. S. space program, for younger boys.

THE SEAS AND THE SUBS—Ed Rees—*Duell,* 233 p., illus., $4.50. Story of the nuclear-powered, missile-carrying Polaris submarine.

SPACE NOMADS: Meteorites in Sky, Field & Laboratory—Lincoln Lapaz and Jean Lapaz—*Holiday House,* 187 p., photographs, diagrams,

(Continued on p. 358)

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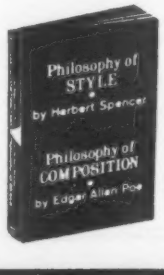

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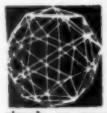

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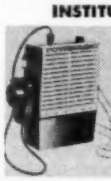

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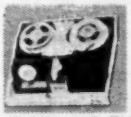

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Books of the Week

(Continued from p. 356)

$3.95. Non-technical introduction to the science of meteorites.

THE STRUCTURE OF MATTER—Francis Owen Rice and Edward Teller—*Science Editions*, 361 p., diagrams, paper, $1.95. Reprint of 1949 edition, explains the microstructure of matter with the help of quantum mechanics.

TEXTBOOK OF BIOCHEMISTRY—Edward Staunton West and Wilbert R. Todd—*Macmillan*, 3rd ed., 1423 p., illus., $16.75. Thoroughly revised facts and theories, contains new chapters on metabolism of special tissues and on nucleic acid metabolism.

THIS CROWDED PLANET—Margaret O. Hyde—*Whittlesey House*, 159 p., illus. by Mildred Waltrip, $3. Explains the complex problems of population pressure to young people.

TIME AND THE PHYSICAL WORLD—Richard Schlegel—*Mich. State Univ. Press*, 211 p., diagrs., $7.50. Examines time as an aspect of the natural universe, from cyclical processes and clocks to time and quantum theory.

TOMORROW'S ILLITERATES: The State of Reading Instruction Today—Charles C. Walcutt, Ed., introd. by Jacques Barzun—*Little*, 168 p., $3.95. Sponsored by the Council for Basic Education, a group of specialists explores the consequences of mistaken theories of reading instruction.

TRAINED AND SCULPTURED PLANTS: A Handbook—Emily L. Brown, Ed.—*Brooklyn Botanic Garden*, 64 p., illus., paper, $1. Guide to the trimming and training of trees, shrubs and vines.

U. S. GOVERNMENT FILMS FOR PUBLIC EDUCATIONAL USE, 1960—Seerly Reid with Katherine W. Clugston and Annie Rose Daugherty—*Off. of Educ. (GPO)*, 502 p., $2.75. Alphabetical, annotated listing by title and by subject of motion pictures and filmstrips available from all branches of the Federal Government.

WATCHERS AT THE POND—Franklin Russell—*Knopf*, 265 p., illus. by Robert W. Arnold, $4.50. Naturalist observes the cycle of the seasons in the creatures around a pond.

WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE, UNABRIDGED—Philip Babcock Gove, Ed-in-Chief—*Merriam*, 2662 p., illus., $47.50. Completely new, authoritative and precise definitions of 450,000 generic words in written and spoken English, giving derivations, forms, sounds and meanings. Usefulness is stressed, obsolete words are omitted to make place for such terms as "Van Allen radiation belts" and "Zinjanthropus."

WHAT IVAN KNOWS THAT JOHNNY DOESN'T—Arthur S. Trace, Jr.—*Random House*, 213 p., $3.95. A comparison of Soviet and American School programs, grade school readers, study of literature, foreign languages, history and geography.

WINTERING OF PLANTS—I. M. Vasil'yev, transl. from Russian by Jacob Levitt, Ed.—*AIBS*, 300 p., illus., $9. Translation of recent research indicating the aims, concepts and methods of Russian plant scientists.

THE WONDERFUL HUMAN MACHINE — *Am. Medical Assn.*, 56 p., illus., paper, $1 directly to publisher, 535 N. Dearborn St., Chicago 10, Ill. Simple description of the structure and functioning of the human body.

THE WONDERS OF LIFE ON EARTH—Editor of LIFE and Lincoln Barnett, adapted by Sarel Eimerl—*Golden Press*, 216 p., illus.. $4.95. Special edition for young readers of this colorful review of animal life and evolution.

WRITING GUIDE FOR CHEMISTS—Walter J. Gensler and Kinereth D. Gensler—*McGraw*, 149 p., $4.50. Practical handbook.

• Science News Letter, 80:356 November 25, 1961

MEDICINE

Childhood Diseases Strike at a Younger Age

➤ CLOSER CONTACTS in modern living, even in rural areas, have resulted in children contracting measles, mumps and chickenpox at an earlier age.

A study of health records of 935 boys about 13 to 18 years of age at St. Mark's School, Southboro, Mass., has shown a general decline during the last few decades in susceptible youngsters entering school.

Most important to "get over with" is German measles for which there is no immediately anticipated vaccine as in the case of ordinary measles. This is especially dangerous during pregnancy when it can be harmful to the unborn child.

Drs. Frank L. Babbott, Bruce M. Rodenberger and Theodore H. Ingalls of the University of Pennsylvania, Philadelphia, report the study in the Journal of the American Medical Association, 178:542, 1961.

• Science News Letter, 80:358 November 25, 1961

MEDICINE

Aging Symptoms May Cause Deficient Thyroid

➤ AGING PATIENTS who appear senile may be suffering from deficient production of thyroid hormone (hypothyroidism).

In a study of 58 cases of hypothyroidism at the Oldham and District General Hospital, Oldham, Lancashire, England, researchers point out that results of treatment with a thyroid extract were good, although caution had to be taken in treating those with heart abnormalities.

The general practitioners who referred the aging patients to the hospital did not suspect thyroid deficiency in 90% of the cases. Most were sent as examples of heart failure, cerebral thrombosis, anemia or bronchitis, with a few labeled simply as "senile."

Treatment with L-thyroxine, a thyroid extract, might possibly have reduced or even prevented hardening of the arteries which afflicted many of the patients.

However, treatment should be carried out in a hospital or under the care of a medical attendant, Drs. W. H. Lloyd and I. J. L. Goldberg, now at the University College of the West Indies, Kingston, Jamaica, report in the British Medical Journal Nov. 11, 1961.

• Science News Letter, 80:358 November 25, 1961

Questions

ASTRONOMY—How close did the comet Seki come to earth? p. 351.

METEOROLOGY—How many typhoons were tracked by Tiros in the Pacific? p. 347.

Photographs: Cover and p. 347, Committee of Stainless Steel Producers; p. 349, University of Pennsylvania; p. 351, Bell Aerosystems Company; p. 360, Kingsway, Inc.

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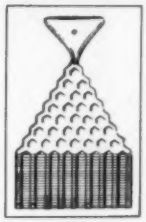
STATISTICAL DISTRIBUTIONS DISCUSSED IN THE KIT AND EXPERIMENTS: Uniform Distribution in one and two dimensions; Binomial Distribution; Normal Distribution; Chi-Squared Distribution; Poisson Distribution; Multinomial Distribution.

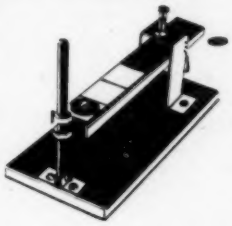
From the Instruction Book's preface by Dr. Frederick Mosteller, Professor of Mathematical Statistics, Department of Statistics, Harvard University, Cambridge, Mass.:

. . . Some may feel that this sort of material is only for the youth who is quick at science and mathematics, and certainly such a youngster will profit mightily. But it is not so well known that children, retarded in the mathematical areas, brighten up when presented mathematical tasks derived from experiments they have executed themselves . . .

In all the talk about science and mathematics, let's not forget that experimentation with mathematical ideas is fun. And hours and hours of such instructive fun are in the Berkeley book and lab. How do I know? In preparing this introduction, I have been greatly hampered by my not-very-studious 14-year old who busily instructs me in the use of all these materials.

Now if you'll excuse me, I have a new theory I'd like to try on the coin-flipping machine. Have fun!





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New Ideas and Gadgets

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CORNER PATCHING TOOL especially designed for patching corners has an angled blade that evenly distributes plaster or cement in the smallest corner, eliminating waste and saving time. The tool, suitable also for brick pointing, stair angles or jointing cement, has an easy grip handle and a blade of rust-proof hardened tempered tool steel.

• Science News Letter, 80:360 November 25, 1961

MINIATURE POLISHING SPONGES are 2-x-1¼-inch cellulose sponges impregnated with a cleaning and polishing compound to remove stains on silverware and plastic ware. Each carton of five sponges contains a plastic sponge holder to keep hands clean and dry while using them.

• Science News Letter, 80:360 November 25, 1961

OCTAGON-SHAPED LOUVERS, especially designed for use in front-gable architecture, have vanes of tough plastic secured to an eight-sided white pine frame. Resistant to impact and weathering, the vanes, which never need painting, are backed with an aluminum screen. Of thinner gauge than wood, they provide greater ventilation.

• Science News Letter, 80:360 November 25, 1961

PLASTIC CHESSMEN, shown in the photograph, are replicas of hand-carved figurine pieces of the 11th century. Impact resistant and virtually indestructible, the chessmen are steel-weighted for balance and felted to protect the chessboard. Available in black and ivory and red and ivory, the sets come in a variety of sizes.

• Science News Letter, 80:360 November 25, 1961

GARBAGE CAN BAG is a jumbo size, inexpensive, disposable bag of clear plastic that replaces a paper bag. Waterproof and extending several inches over the top edge of the can and secured by means of an elastic band, it will keep the inside of the garbage can clean and dry.

• Science News Letter, 80:360 November 25, 1961

HAND CLOTHES WASHER for light laundry is a hand-manipulated washing device that permits washing without wetting the hands. The perforated rubber nose of the washer containing a rustproof steel spring creates a powerful suck and jet-squirt action that penetrates any fabric by pushing a plastic handle up and down. Complete instructions are included with the unit.

• Science News Letter, 80:360 November 25, 1961

APPLE CORER AND CUTTER takes out the core and divides the apple into 14 slices with one stroke. Chrome finished and with stainless blades, the device is also suitable for slicing other fruits and vegetables.

• Science News Letter, 80:360 November 25, 1961

CHILDREN'S LEASH prevents the toddler from straying while mother is shopping. Adjustable wristbands for mother and child, connected by an expandable, tangle-free swivel cord, leave the mother's hands free for packages and gives freedom of movement to the child. Wristbands are secure yet easily removed.

• Science News Letter, 80:360 November 25, 1961

Nature Ramblings

Acorns and Wildlife

► THE ACORN is one of the greatest sources of mast—a collective term for nuts. Mast is a wildlife food of great value, for it contains a quantity of carbohydrates and lesser amounts of protein. The carbohydrates provide heat and energy—so necessary for the winter survival of many animals. For wildlife the protein is a great builder of tissue that needs to be strong during winter.

Among the acorn-bearing trees, those classified as "white oaks" produce the sweetest acorns. They are the fall and winter mainstay in the diets of such birds as the quail, grouse and turkey, and such mammals as the bear, deer, raccoon and squirrel.

The gray squirrel feeds constantly on these acorns. It revolves this nut between its paws as it gouges out the sweet meat with sharp teeth. As a squirrel eats, bits of acorn drop from its perch to the ground. These crumbs are food for quail and various resident songbirds.

The acorn is well liked by at least four species of woodpeckers. In the East, the red-headed and red-bellied woodpeckers eat quantities of these nuts during fall and winter. In the West, the Lewis and California species show an equal liking for acorns. In fact the California woodpecker has such a preference for them that it is often called the "acorn woodpecker."

Our most colorful duck, the wood duck, is a great eater of acorns. This is really not so surprising, for this bird nests in trees and, therefore, is at home in a wooded habitat. And the mallard is also an acorn-eater, though its consumption is not so great as that of the wood duck.

• Science News Letter, 80:360 November 25, 1961

Do You Know?

Insects have been trapped from airplanes as high as 19,000 feet.

There are 460 *poison* control centers in the United States to provide physicians with information on the ingredients of new drugs and household products and antidotes for them.

Fluoridated water apparently contributes to the development of straight *teeth* as well as to the prevention of tooth decay.

Of the more than $60 billion spent on *research* in the history of U.S., $30 billion have been spent in the past five years.

Some 30,000 *veterans* stricken by cancer are being treated each year in Veterans Administration Hospitals.

The change in the basic pattern of *living* in the United States to a more relaxed and informal one is reflected in the landscaping design around homes and community buildings.

• Science News Letter, 80:360 November 25, 1961